DOCUMENT RESUME

ED 038 992 LI 001 919

TITLE	Book Processing Facility Design.
INSTITUTION	Sheahan (Drake)-Stewart Dougall, Marketing and Physical Distribution Consultants, New York, N.Y.
SPONS AGENCY	Association of New York Libraries for Technical Services, Garden City, N.Y.
REPORT NO	R-1604
PUB DATE	3 Dec 69
NOTE	76p.
EDRS PRICE	EDRS Price MF-$0.50 HC-$3.90
DESCRIPTORS	Books, Centralization, Estimated Costs, Facilities, Library Expenditures, *Library Technical Processes, Program Costs, Public Libraries
IDENTIFIERS	ANYLTS, *Association New York Libraries Technical Services

ABSTRACT

The Association of New York Libraries for Technical Services (ANYLTS) is established to develop and run a centralized book processing facility for the public library systems in New York State. ANYLTS plans to receive book orders from the 22 library systems, transmit orders to publishers, receive the volumes from the publishers, print and attach pockets, print and insert catalog cards and book cards, apply spine labels, overjacket book covers, and ship processed books by library to the library system. The recommended processing operation will require a physical facility containing 18,800 square feet and is estimated to cost $56,640 per year. At a projected rate of $10,000 per man year (1976) and an average work force of 66 employed, labor will cost $660,000 per year. Equipment investment is estimated to be $221,000. The processing operation recommended is a manual system supplemented by two labor-saving mechanical devices. (MF)

ASSOCIATION OF NEW YORK LIBRARIES FOR TECHNICAL SERVICES
Garden City, New York

BOOK PROCESSING FACILITY DESIGN

3 December 1969

DRAKE SHEAHAN / STEWART DOUGALL
MARKETING AND PHYSICAL DISTRIBUTION CONSULTANTS
330 Madison Ave., New York, N.Y. 10017 Tel: 212 697-0294

ASSOCIATION OF NEW YORK LIBRARIES
FOR TECHNICAL SERVICES
Garden City, New York

BOOK PROCESSING FACILITY DESIGN

3 December 1969

Director:
Mr. R. J. Sweeney

Manager:
Mr. John R. Wells

Consultants:
Mr. Michael L. Brody
Mr. David B. Stone, Jr.

Report No. 1604
Copy No. 33

CONTENTS

EXHIBITS

EXHIBIT H - MANNING

Schedule H-I - Manning Requirements and Costs

Schedule H-II - Manning Requirements and Costs -- Basic Manual System

Schedule H-III - Seasonal Factor in Labor Requirements

SECTION I

SUMMARY

ANYLTS has been established to develop and run a centralized book processing facility for the public library systems in New York State. ANYLTS plans to receive book orders from libraries, transmit orders to publishers, receive the volumes from the publisher, print and attach pockets, print and insert catalog cards and book cards, apply spine labels, overjacket book covers, and ship processed books by library to the library systems.

A volume of 2.8 million books per year is anticipated if all 22 library systems in the state subscribe to ANYLTS' service. The service would not be undertaken unless the major Metropolitan New York area library systems joined. These systems represent an activity of 1.7 million books per year.

ANYLTS has acquired a staff to develop the complex control systems required to operate the service.

ANYLTS has retained our firm to develop the methods and costs for physically processing the books. The quantitative inputs on which the processing system is based are presented in Exhibit A.

The recommended processing operation will require a physical facility containing 18,800 square feet of operating and storage space. At $3 per square foot, this is estimated to cost $56,640 per year.

Using a 1976 labor rate of $10,000 per year per man, labor will cost $660,000 per year. The $10,000 per year per man was developed by taking a base of $4,800 per year adding 30 percent fringe benefits and increasing this at 8 percent compounded annually for 6 years. Our recent experience

shows 8 percent per year to be the trend in wage increases.

At 1976 design year volumes an average workforce of 66 employees will be required in the processing operation. The manning was determined by detailing the required operations and applying times developed from direct observations at the Nassau, Queens and Suffolk library systems. Where no comparable operations existed, government time standards[a] were used.

Equipment investment is estimated to be $221,000. This includes storage bins and carts, materials handling and storage units, and specialized equipment for applying labels and sorting books. Processing materials used in the recommended system are essentially the same as in current use in the present library systems.

Estimated costs per book are as follows:

	Cost per book	
	1.5 million books	2.8 million books
Labor	$.274	$.249
Processing materials[b]	.058	.058
Equipment	.020	.016
Rent	.040	.020
	$.392	$.343

[a] "Materials Handling Standard Time Data." Department of Defense, 1 March 1967. Office of the Assistant Secretary of Defense installation DOD 5010.15.1-M.

[b] Cost of catalog cards not included.

We recommend that you work in the direction of establishing a single processing unit activity. Delivery service requirements within the State can be met adequately if shipments are made from a central point. Supervision requirements and communication channels will be minimized. Labor can be used more effectively and opportunities for mechanization are greater. Duplication of peripheral facilities will be minimized.

The recommended processing activity includes two mechanized operations that have not been fully tested in a book processing function. These are semi-automatic labeling, and conveyor sorting to library system categories. These concepts are being used effectively in comparable operations and we are confident that they can be modified to satisfy your book processing requirements.

A third mechanized operation, film laminating dust jackets, appears to be promising. However, no demonstration of a satisfactory machine could be arranged prior to the close of this study and this type of film laminating has not been used in the development of our recommended procedures. We suggest that you pursue further the successful solution of this concept as it will have a significant impact on the cost of assembling the dust jacket into a plastic cover.

In Section II, the recommended system is explained. Processing costs and the sensitivity of these costs to changes in volume are given in Section III. A plan for implementing the recommended operation is detailed in Section IV. Throughout this Report, references are made to Exhibits which may be found appended to the text.

SECTION II

RECOMMENDED SYSTEM

This Section describes the recommended building configuration and methods. Detailed layouts are shown in Exhibit D. Material and information flow, and processing cycle times are illustrated graphically in Exhibit B.

A. Building.

The processing building should contain 18,880 square feet and be rectangular in shape. The processing portion of the building should be 160 feet by 118 feet. Three truck docks should be located near the center of the south (118-foot) wall. The offices and computer should be either on a second story or to the west of the processing area. Expansion should be either to the north or east. A summary of space requirements is given in Exhibit C, Schedule C-I. Building functional specifications are stated in Schedule C-II.

B. Methods.

The following is a step-by-step description of the operation:

1. Unload cartons of books onto pallets. The dockman will take an empty pallet (Schedule F-IV) to the truck tailgate. The driver will stack cartons on the pallet. The dockman will check cartons against the bill of lading, place the pallet in storage on pallet racks (Schedule F-III) by means of a straddle-type walkie fork lift truck (Schedule F-II) and inform the receiving manager of the arrival.

2. Deliver pallets of books to check-in as required. The receiving storage will serve as a buffer to level production. As the checkers complete a pallet,

the stockman will bring forward another full pallet of cartons to be checked in. The receiving manager will insure that lots are processed in order of arrival.

3. Unpack and shelve books by title. The checkers will open the cartons carefully so that they can be reused Books will be removed from the cartons and stacked on mobile bins (Schedule F-V) by title. The checker will examine the invoice before shelving a lot. He will note all instances of a large number of books within a title and estimate the space required. He will leave 10 percent of each shelf open so that if reshuffling is required when checking it can be accomplished with a minimum of reshelving. A mobile bin can contain books from more than one invoice or from a part of an invoice. However, a title should not be split between two mobile bins. Empty cartons will be sorted into reusable and damaged groups, and stacked on pallets.

4. Post storage location for each title and correct invoice to show amount actually received. The checker will check from the books to the invoice. He will write the mobile bin number, the shelf number and the location on shelf number in an open space on the invoice opposite book title. He will check the number of books for a title against the invoice, and correct the amount if found necessary. If, while checking, he finds that he has inadvertently split a title, he will reshelve the books to get the title together. The 10 percent of the shelves left open should accommodate most reshuffling. It is permissable to move books away from their storage location as long as the order of the title is undisturbed. He will cross off titles not received. The packing list will be used for checking if no invoice is available.

5. Deliver completed invoice to computer section for processing.

6. Place filled mobile bins into mobile bin storage.

7. Print catalog cards and processing labels on computer printer. Catalog cards will be printed in sets which will be separated and collated into glassine envelopes. Envelopes will be in bin control number order with bin lots. Labels will be printed on rolls; the book label will be followed by the library label, and one or two book card labels as required. Spine labels will be printed separately. The labels will be in shelf location order within bin number.

8. Label book pocket and book cards, and collate catalog cards. Rolls of labels will be fed into semiautomatic labeling machines. Labels will be attached to book pocket and book card at the machine station (Schedule D-IV). Catalog cards will be matched to book pocket. Book cards and catalog cards will be placed in order in a tray.

9. Attach spine labels roll and process control card pack to book pocket tray. A roll of spine labels and a pack of process control cards will be produced for each mobile bin. Books not requiring processing will have a "No-process" card printed and included in the process control behind its title control card.

10. Deliver book pocket tray and its mobile bin of books to a processing line. Workload assignments should be made to insure a balanced processing load.

11. Place pocket in book and attach spine label. Match book title with pocket. Apply glue to pocket and place in book according to code on library label. Feed roll of spine labels into semiautomatic labels. Apply spine label. Place "No-process" card in "No-process" books.

12. Place plastic cover around dust jacket. Select correct size plastic cover from code on process control card. If there is no code, measure book

and write code on process control card. Remove dust jacket from book. Place cover around dust jacket. Replace cover on book.

13. Glue cover to book and place book on sorter conveyor. Place book on sorter conveyor so that library system portion of the spine label is visible and oriented for easy reading by the sorter operator.

14. Sort books to library system chutes. The sorter operator will key the system number into the sorter memory. The sorter conveyor will divert books at the chute specified.

15. Sort books to library bins. Sorters will pick up books from system chutes and place books into the library bins (Schedule F-VI).

16. At the end of the day, return completed process control cards to computer section. Complete process control cards will be assembled by the book covers. All books that have been covered must be in the library bins by the end of the day.

17. At the end of the day, push books to the back of the library bins. The sorters and packers will push books to the back of the library bins to show the break in the cycle.

18. Prepare packing list on the computer printer for each library. The process control cards will be the input of this program.

19. Pack books by library from library bins. Check book count against packing list. Place small lots into envelopes and attach library label. Consolidate small lots into cartons by system. Pack large lots into cartons. Seal and label all cartons. A packing cart (Schedule F-VII) should be used in this operation.

20. Stack cartons on pallets by system and transport to shipping storage. Shipping storage will be the buffer between packing and shipping. Pallet racks should be used as required.

21. Deliver pallets for each system being shipped to truck tailgate and complete shipping paperwork. Most library systems will be shipped daily. Some small systems may require two days' processing to reach minimum LTL rates.

SECTION III

PROCESSING COSTS AND COST SENSITIVITY

This Section contains a summary of labor, processing materials, equipment and building rent costs for the recommended book processing operation. Design parameters on which these costs are based are given in Exhibits A, B and C. Alternate methods that have been evaluated are detailed in Exhibit E. Equipment requirements and costs are given in Exhibit F. Recommended operating methods and job descriptions are specified in Exhibit G. In Exhibit H, manning requirements are developed.

Cost Summary

	Cost per book
Labor	$.249
Processing materials[a]	.058
Equipment	.016
Rent	.020
Total	$.343

[a]Cost of catalog cards not included.

Part A

Processing Costs

1. Labor

Million books processed per year		2.8
Manning required		66
Man-minutes per book		2.52
Annual labor cost per man $10,000		
Cost per book		$.249

2. Processing materials

Pocket, cards and labels per book		$.013
Book cover per book		.045
Cost per book		$.058

3. Equipment

Total equipment cost	$221,000	
Annual cost, five-year life	44,200	
Cost per book		$.016

4. Building

Square feet required	18,800	
Rental cost per square foot		$3.00
Rental cost per year	$56,640	
Cost per book		$.020

Part B

Cost Sensitivity

The measures of cost sensitivity to different processing variables have been developed. The significant conclusions drawn from this analysis are:

1. Labor cost per book will increase 10 percent if throughput volume is reduced to 50 percent of design volume.

2. Processing materials will vary directly with volume.

3. Fifty percent of the equipment investment cost, in dollars, will be required for a minimum operational effort (1.5 million books per year). The remaining equipment can be added as volume increases. In terms of cost per book, the initial equipment cost will decline as volume increases while the subsequent equipment purchase cost will vary almost directly with volume increase. The net effect of these interactions is that equipment cost per book may be about 25 percent higher at 50 percent of the design year volume. A major factor contributing to this cost variable will be the cost of the sortation system which, of necessity, must be designed to accommodate the design year throughput volume and will not operate at full capacity at initial volumes.

4. The facility rent cost will be a fixed expense. Expressed in terms of cost per book, it will vary inversely proportionally to the throughput volume. Facility space cannot be reduced effectively as there are certain minimum requirements for the processing operations and the peripheral activities. Conversely, throughput volumes larger than those planned for the design year

can be accommodated by increasing the man-hours available through the use of overtime or multiple shifts.

5. If the design year throughput volume can be realized, a single processing unit should be the most efficient operation. Total supervision and space costs per book will be higher if multiple units are used, and the opportunity for labor cost reduction through the use of mechanization will be lost. Adequate transportation service can be provided to all points in the state system form a single processing point. Hence, multiple units are not needed to satisfy transportation requirements.

SECTION IV

IMPLEMENTATION

The system recommended is a straightforward manual system supplemented by two labor-saving mechanical devices. These devices, the semiautomatic labeling machine and the sortation conveyor, should be tested before the operation is begun. The continuous feed book covering method and pocket preparation using either automatically labeled pockets, or the continuous form pockets, should be investigated further to determine if these methods are feasible in terms of operating reliability and cost. The balance of the operation makes use of previously tested methods and equipment.

We recommend that the Nassau Library System experiment with semiautomatic labeler. Our breakeven analysis indicates that these labelers would pay at their volume. The operational experience gained would be useful in the start-up at the ANYLTS operation.

Speaker Sortation Systems should be sent a few cartons of assorted books so that they can test out these items on their machine and develop a damage-free sorting chute.

Several automatic labeling machine companies should be sent samples of labels and pockets to determine whether automatic labeling is feasible.

Investigation of an acceptable continuous form should be continued.

Investigation of continuous web book covering should be continued.

When a suitable building is found, the layout should be reviewed so that such modifications as may be necessary can be made with a minimum loss of operational efficiency.

The following table shows the steps which must be performed before startup and the lead times necessary to start each implementation step to avoid operating delays.

Physical Processing Lead Time

	Required lead time (weeks)
1. Determine feasibility of automatic sortation.	60
2. Determine feasibility of continuous web book covering.	60
3. Decide on pocket preparation method.	60
4. Select a facility.	55
5. Modify layout to accommodate facility.	53
6. Order sortation system.	52
7. Order continuous web cover machines (if system proves feasible).	52
8. Order walkie-lift truck.	36
9. Order mobile bins, library bins and pallet rack.	12
10. Order labeling machines	12
11. Construct processing lines.	12
12. Order packing carts, pallets work tables, dockboards.	12

EXHIBIT A

PROJECT PLANNING FACTORS

This Exhibit contains the quantitative inputs on which the facility design is based and consists of the following:

Schedule A-I -- Given Planning Factors. This Schedule includes the quantitative inputs developed by ANYLTS.

Schedule A-II -- Developed Planning Factors. This Schedule includes the quantitative inputs developed from analysis of operations in the existing library system and assumptions made.

The sensitivity of the facility design to the planning factors will be shown in Schedule H-III.

Schedule A-I

Given Planning Factors

1.	Design year	1976
2.	Book volume in design year	2.8 million
3.	Library systems served	22
4.	Libraries within library systems	1,025
5.	Labor rate including 30 percent fringe in design year	$10,000
6.	Books for which NYPL has no cataloging information	5 percent
7.	Time required for original cataloging	3 days
8.	Building rent	$3 per square foot

Present Book Volumes by Library and System

	System books added -- 1966	Percent of total	Cumulative percent	Number of libraries in system	Number of libraries acquiring books within the stated range (Range in thousands of books)													
					0 to 1,000	1,000 to 2,000	2,000 to 3,000	3,000 to 4,000	4,000 to 5,000	5,000 to 6,000	6,000 to 7,000	7,000 to 8,000	8,000 to 9,000	9,000 to 10,000	10,000 to 12,000	12,000 to 14,000	14,000 to 16,000	16,000 and over
New York City	478,000	18	18	81	3	10	18	17	9	7	4	2	1	2	3	1	2	2
Brooklyn	323,000	12	30	57	2	3	8	17	8	5	5	5	3					1
Nassau	322,000	12	42	48	1	6	4	4	3	4	6	5	4	3	4	1	2	1
Queens	242,000	9	51	56		9	17	9	6	2	4		2	4	1	1		1
Buffalo Erie	203,000	8	59	55	15	10	11	6	2	2								2
Suffolk	162,000	6	65	43	12	7	4	5	3	1	2	2	2	1	3	1		
Westchester	134,000	5	70	38	9	10	7	5	4					1	1			1
Pioneer	118,000	4	74	76	37	20	13	3			1	1						1
Ramapo Catskill	84,000	3	77	47	27	11	4	1	1		1			1				1
Four County	60,000	2	79	37	31		1	1	2							1		1
Nioga	58,000	2	81	20	10	3	2	2	1	1								1
Onondaga	58,000	2	83	22	15	5				1								1
Mid-York	51,000	2	85	37	28	5	1		1					1			1	
Chautauqua-Cattaraugus	50,000	2	87	32	19	8	2		1		1					1		
Upper Hudson	46,000	2	89	22	15	2		1	1	2								1
Chemung-Southern Tier	45,000	1	90	39	30	2	2	2			1		1			1		
Mid-Hudson	44,000	1	91	52	42	7		1	1						1			
Mohawk Valley	33,000	1	92	14	8	3	1	1										1
North Country	30,000	1	93	58	53	1	2	1							1			
Finger Lakes	29,000	1	94	27	24		1	1								1		
Southern Adirondack	27,000	1	95	25	20	2	1		1					1				
Clinton-Essex-Franklin	20,000	1	96	25	23	1	—	—	—	—	—	—	1	—	—	—	—	—
Total	2,622,000			913	424	134	99	77	44	25	25	15	14	14	14	8	5	15
Percent					46	15	11	8	5	3	3	2	1	1	1	1	1	2
Cumulative percent					46	62	72	80	85	88	91	93	94	95	96	97	98	100
Average books per day					2	6	10	14	18	22	27	31	35	39	45	53	61	-

Source: 1966 Public and Associated Libraries Statistics. Branch volumes are for 1968 and were obtained from the Systems.

---

[a]Less than 100 percent due to rounding.

Schedule A-II

Developed Planning Factors

1. Books per handling:

Unloading cases onto mobile bins	2.5
Unloading mobile bins onto processing line	5
Manual sort	
Returning books to mobile bin	5
Sorting books to library bin	1
Mechanical sort by system	
Sorting books to library bin	5

2. Physical characteristics of books:

	Inches		
	Length	Width	Thickness
Large	18	12	2
Average	8 1/2	6	1
Small	8 1/2	5	1/8

3. Storage characteristics:

Books per carton received	30
Cartons per pallet (66 percent utilization)	20
Books per mobile bin (90 percent utilization)	450

4. Processing characteristics:

Titles per day not previously processed	184
Books per title	4
Books per invoice	53
Books requiring cover adjustment	50 percent
No cover books	5 percent
No processing books	5 percent
Books with no invoice or packing slip	2 percent
Average time in weeks to get missing invoice	2

5. Seasonal factor:

Peak above average	32 percent

6. Receiving and shipping:

Trucks per day	12

Source: Nassau Library System.

EXHIBIT B

FLOW

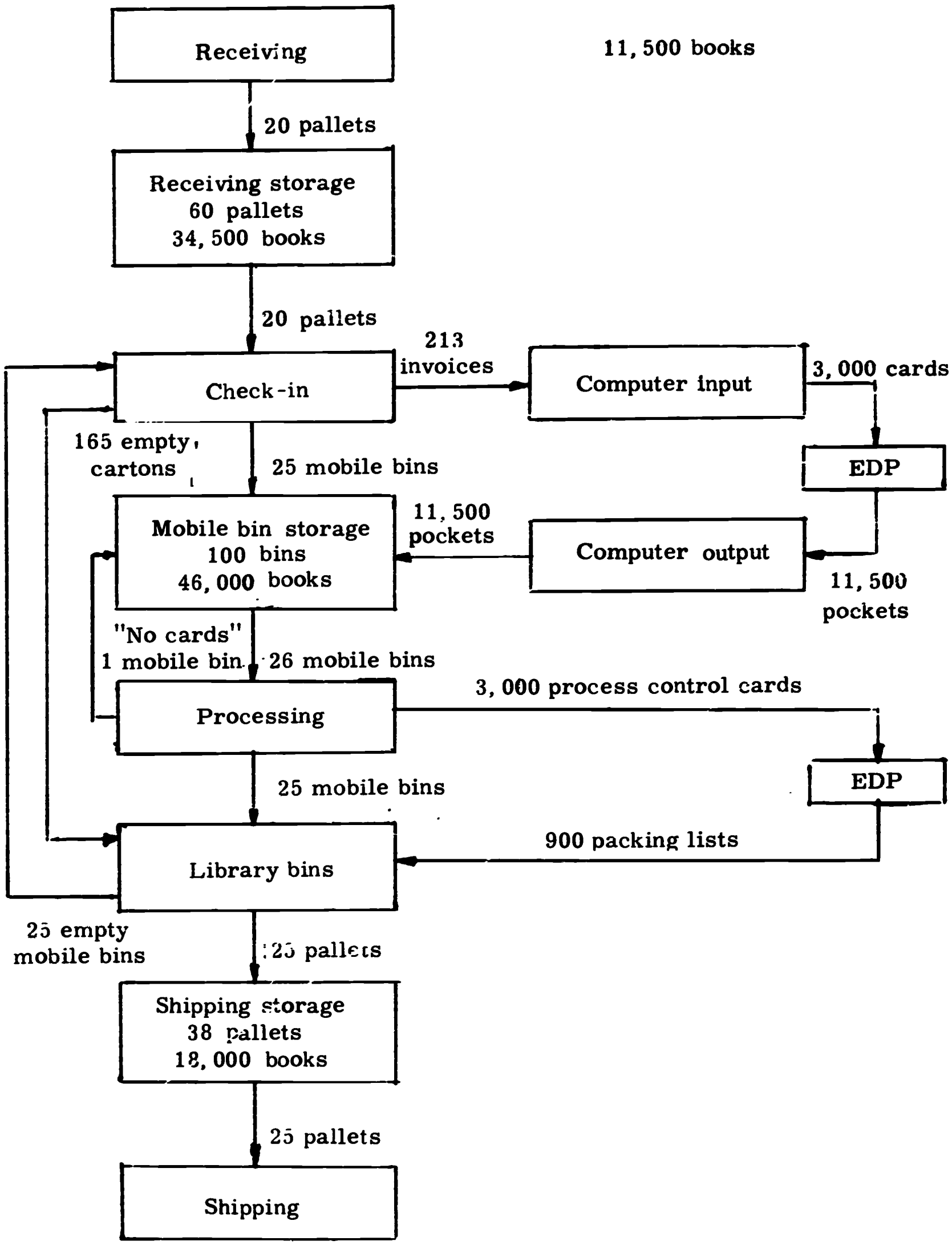
This Exhibit contains the flow paths on which the facility design is based:

Schedule B-I -- Material and Information Flow

Schedule B-II -- Cycle Time

Schedule B-I

Flow Diagram



Volumes expressed in units per day.

Schedule B-II

Cycle Time

(Assuming optimum conditions)

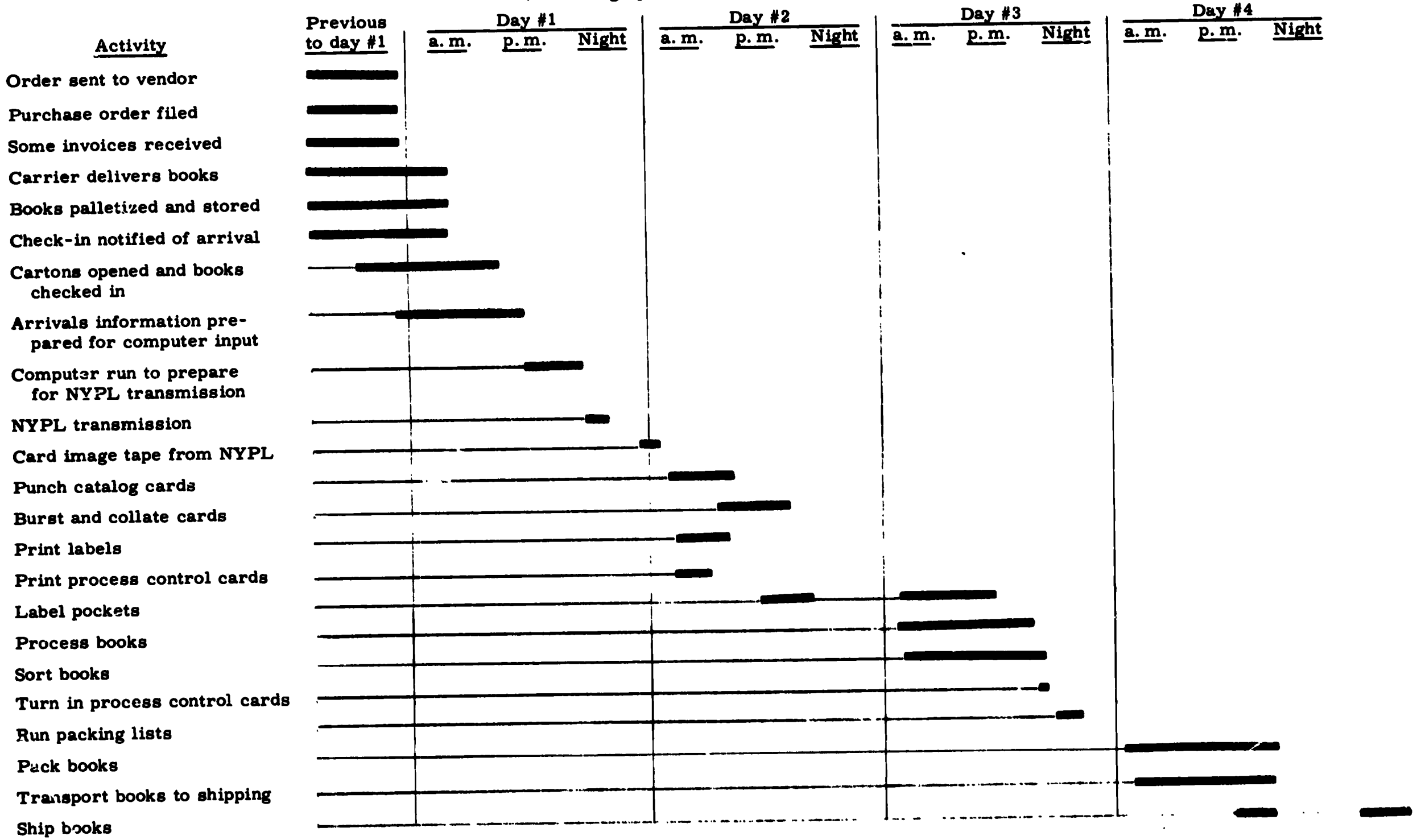


EXHIBIT C

BUILDING

Schedule C-I

Space Requirements

	Square feet
Dock	430
Pallet storage	1,460
Mobile bin storage	2,560
Check-in	1,160
Pocket preparation	1,220
Processing	8,670
Library bins	3,380
Total	18,880

Schedule C-II

Building Functional Specifications

The layout (Schedule D-I) should be opened for reference when reading these specifications.

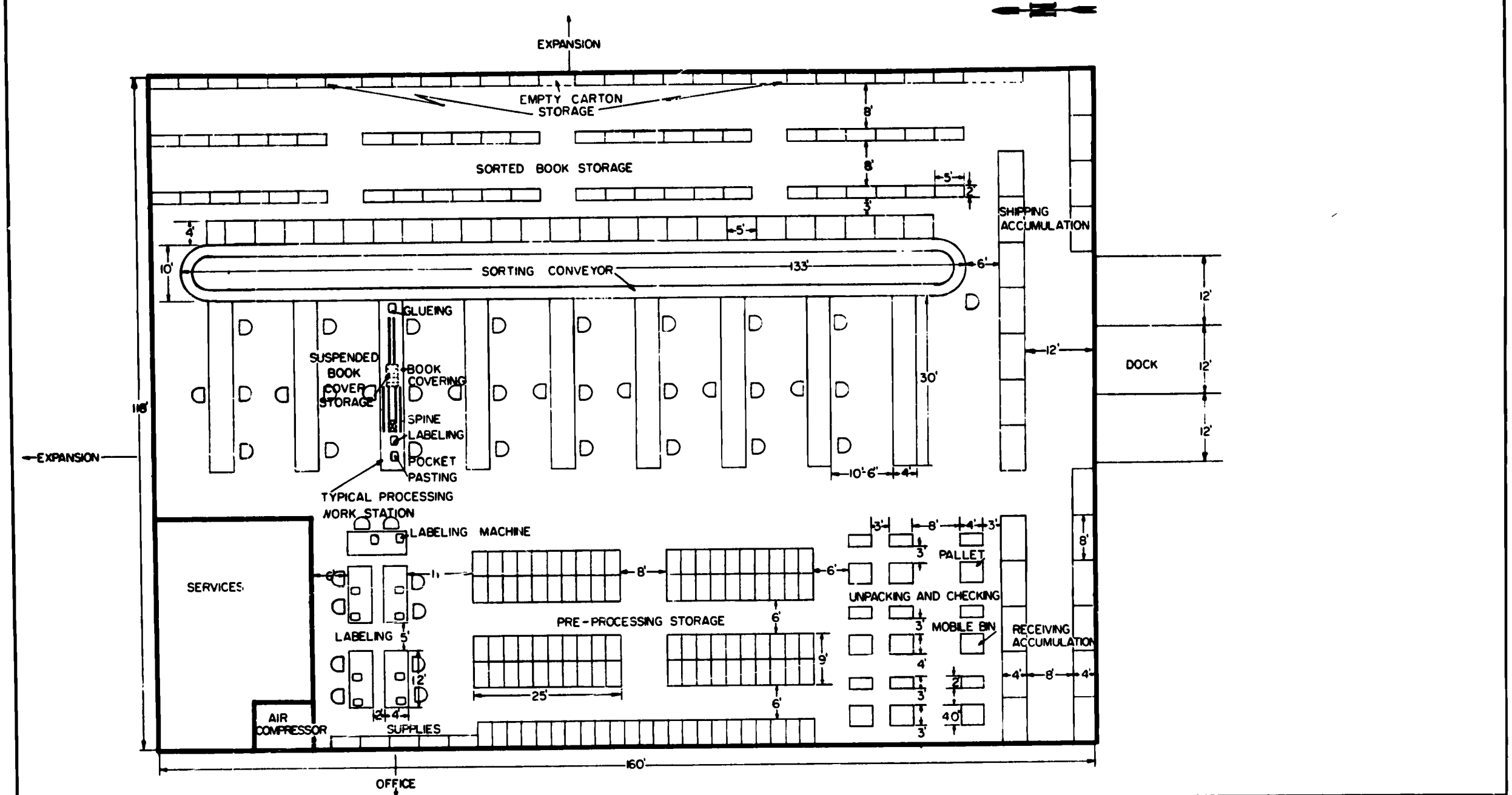
Since an existing building will be used the building configuration may require some changes in the layout. These specifications should be used as a guide in selecting a building. Office and EDP requirements should be in addition to these specifications.

Item	Recommendation
1. Space -- square feet	18,800
2. Number of truck spots	3
3. Dock height -- inches	45
4. Truck spot width -- feet	12
5. Floor loading -- pounds per square foot	250
6. Ceiling height -- clear feet	11
7. Illumination level -- foot-candles	75

Deviations to the above recommendations may be acceptable. Each must be evaluated to determine its effect on the operation.

It is desirable to have dockboards, dock light and door seals on the dock.

Column spacings in a potential building should be superimposed on the layout to determine the amount of interference.



REVISIONS					
DATE	BY	APP.	DATE	BY	APP.

DATE 25OCT69
DRN. MLB
CHK. MLS
APP.

DRAKE, SHEAHAN, SWEENEY AND HUPP
330 MADISON AVENUE NEW YORK 17, N.Y.

SCALE 1/8" = 1'

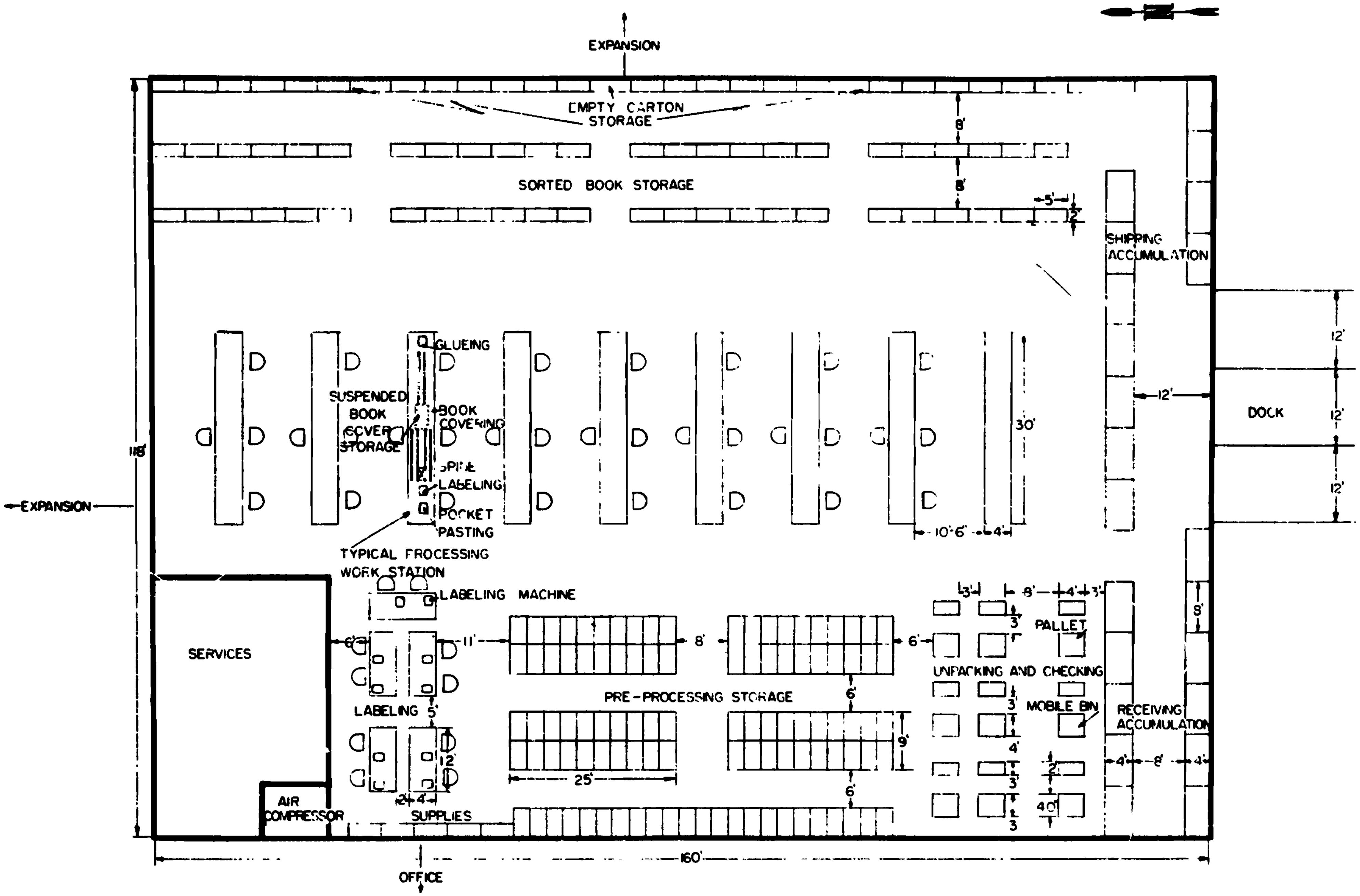
PROPOSED PROCESSING CENTER

(AUTOMATIC SORTATION)

ANYLTS

GARDEN CITY, NEW YORK

DESIGNATIONS	
DWG. 4693	EXHIBIT D-1
JOB 1604	



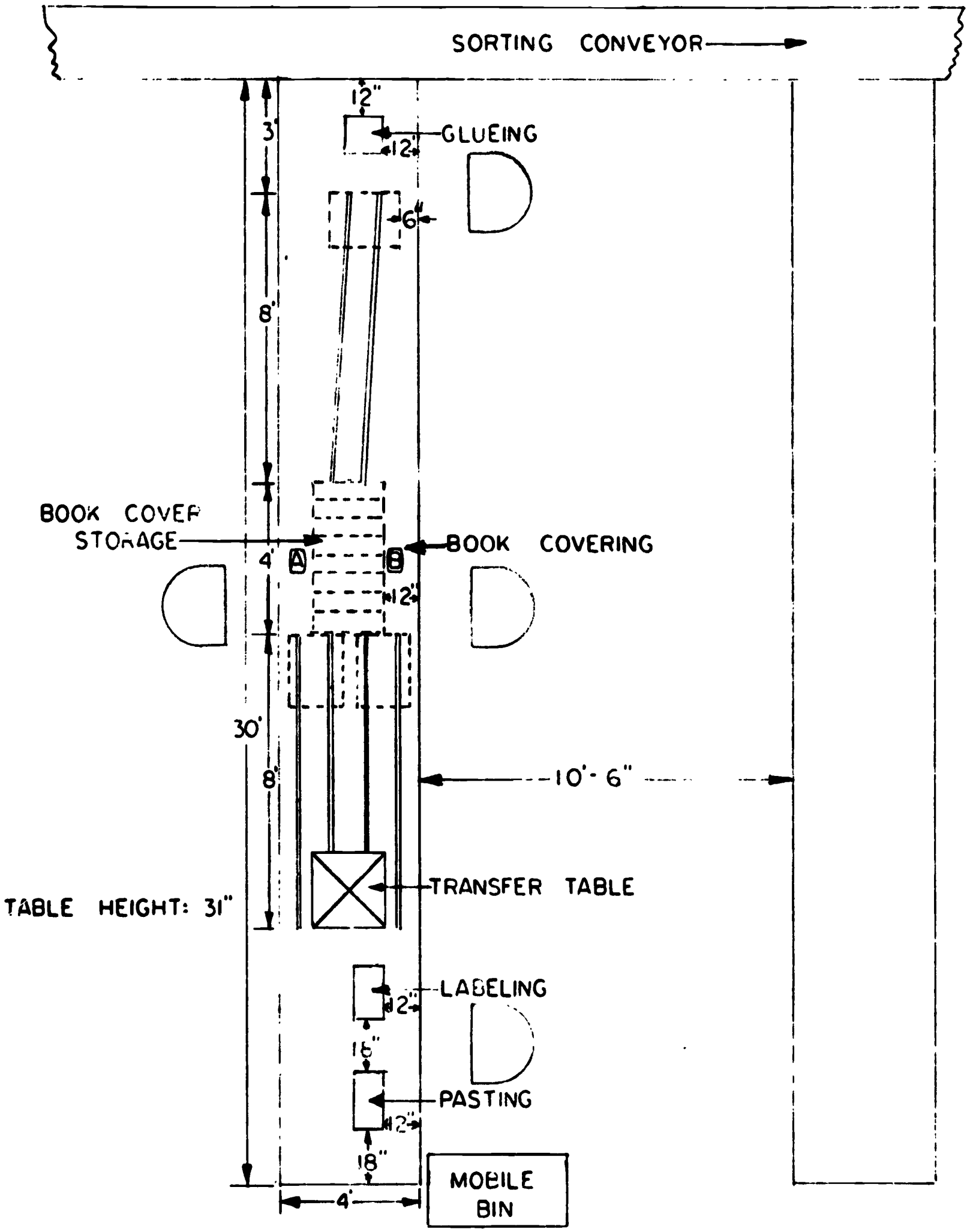
DRAKE, SHEAHAN, SWEENEY AND HUFF
330 MADISON AVENUE NEW YORK 17, N.Y.
SCALE 1/8" = 1'
23 OCT 69

PROPOSED PROCESSING CENTER
(MANUAL SORTATION)

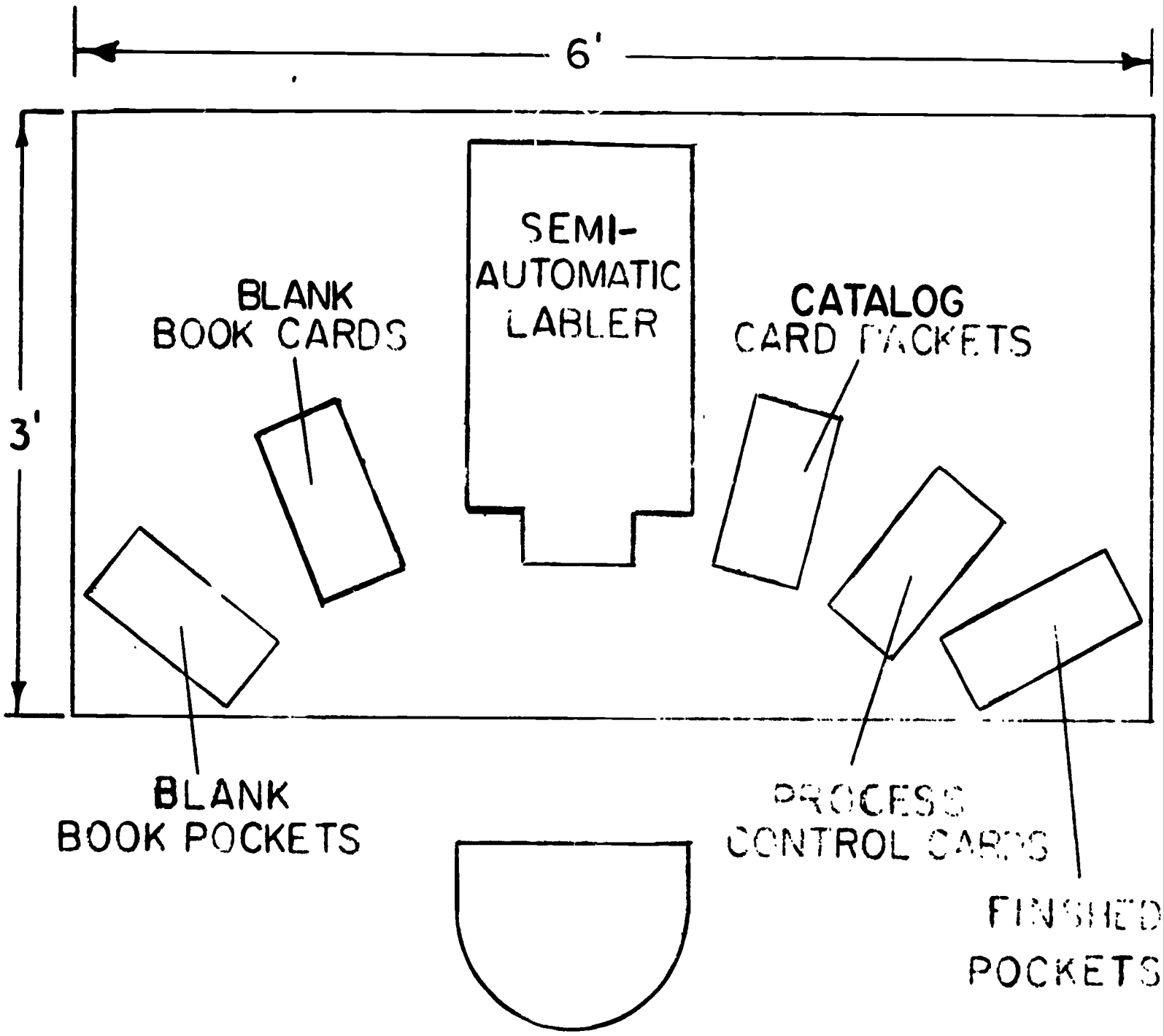
ANYLTS

GARDEN CITY, NEW YORK

4693 D-11
1604



DATE 5NOV	DRAKE, SHEAHAN, SWEENEY AND HUPP	PROCESSING LINE	DESIG.
DRN. MLB	300 MADISON AVE. NEW YORK 17, N.Y.		DWG.
CKD.			REP. 1606
APP.	SCALE 1/4" = 1'		EXH. D III



NOTE: TABLETOP HEIGHT 29"

DATE 20NOV	DRAKE, SHEAHAN, SWEENEY AND HUPP	COLLATING AND LABELING STATION	DES
DRN.	330 MADISON AVE. NEW YORK 17, N.Y.		DWG.
CKD.			REP. 16
APP.	SCALE 1" = 1'		EXH. D-

EXHIBIT E

METHODS EVALUATION

This Exhibit contains the alternate methods evaluated for each function and the logic used to arrive at a recommendation.

The Exhibit contains six Schedules, one for each major functions studied:

Schedule E-I -- Receiving and Shipping

Schedule E-II -- Pocket Preparation

Schedule E-III -- Pocket Pasting and Spine Labeling

Schedule E-IV -- Book Covering and Gluing

Schedule E-V -- Sorting

Schedule E-VI -- Packing

Schedule E-I

Receiving and Shipping

1. Definition: This function receives truckloads and unloads the truck from pallets and takes pallets into and out of storage.

2. Alternates on storage.

a. Storage of pallets on floor.

(1) Procedure. A pallet jack will be used to move pallets and store them on the floor.

(2) Costs.

(a) Equipment

Pallet jack	$300
Allocated over five years	$60

(b) Space

$3 per square foot x 102 pallets x 34.5 square feet per pallet =	$10,550

(c) Total cost $10,610

b. Storage of pallets on pallet rack.

(1) Procedure. A walkie lift truck will be used to move pallets and store them in pallet rack.

(2) Costs.

(a) Equipment

Walkie lift truck	$3,000
Allocate over five years	$600
26 pallet rack sections at $56 = $1,460	
Allocate over five years	$281

(b) Space

$3 per square foot x 102 pallet x 17.3 square feet per pallet = $5,300

(3) Total cost $6,181

c. Summary of yearly storage costs.

Method	Equipment allocation (dollars)	Space cost (dollars)	Total (dollars)	Savings (dollars)
Floor storage	60	10,550	10,610	
Pallet rack storage	881	5,300	6,181	4,429

d. Recommendation. Use pallet rack storage.

3. Number of truck spots required.

a. Requirements.

(1) The average daily shipments and receipts will be transported on 12 trucks.

(2) These trucks can be expected to concentrate their arrivals over a period of four hours.

(3) The average time to unload or load these trucks will be between 15 and 30 minutes.

b. Analysis. The average number of trucks waiting for an open truck dock and the average waiting time for a truck dock are presented in the following tables. Queuing tables were used to develop the values. A table has been developed for an average loading or unloading time of both 15 minutes and 30 minutes.

15-minute unloading or loading time

Truck docks	Average number of trucks waiting	Average waiting time
1	2	45
2	0	2
3	0	0

30-minute unloading or loading time

Truck docks	Average number of trucks waiting	Average waiting time
2	2	39
3	0	5
4	0	0

c. Recommendation. Use three truck docks.

Schedule E-II

Pocket Preparation

1. Definition. This function receives output from the computer and assembles sets of processing materials. Each set will contain all the processing materials in control number order for a mobile bin. The processing material consists of:

   a. For each book:

      (1) A book pocket.
      (2) A book card.
      (3) A spine label.

   b. For each title:

      A process control card.

   c. For each no-process books:

      A no-process card.

2. Alternates:

   a. Manual label application:

      (1) Procedure.

         (a) Four labels will be printed for each title.

         (b) Labels will be split into sets.

         (c) A set will be given a labeler.

         (d) Labeler will apply book pocket and book card labels.

         (e) Labelers will insert book card, catalog cards and process control card into book pocket.

         (f) Labeler will place completed pockets, in order, into book pocket bin and attach set spine labels to each bin.

(2) Costs.

Labor	
17 men at $10, 000	$170, 000 per year
Material	
4 labels at $1. 20 per thousand =	$ 5. 00 per thousand
1 pocket at $5. 24 per thousand =	5. 24 per thousand
1 book card at $2. 74 per thousand =	2. 74 per thousand
Total	$12. 98 per thousand
At 2, 800 thousand books per year	$36, 400 per year
Equipment	
17 work stations at $400 per station = $6, 800	
Allocated over 5 years	$1, 360 per year
Total yearly cost	$207, 760

b. Semiautomatic label application:

(1) Procedure. Same as manual except labeling can be accomplished faster with labeling machine.

(2) Costs.

Labor	
8 men at $10, 000	$80, 000 per year
Material	
Same as manual	$36, 400 per year
Equipment	
8 work stations at $3, 000 per station = $24, 000	
Allocated over 5 years	$4, 800
Total yearly cost	$121, 200

c. Automatic label application.

Note: Some development required to obtain satisfactory machine.

(1) Procedure.

(a) Four labels will be printed for each title.

(b) Labels will be attached to book pocket and book cards in three passes through label machines.

(c) Collator will inspect book card, catalog cards, and process control card into book pocket.

(d) Collator will place completed pockets into book pocket bin.

(e) Collator will attach a sheet of spine labels to each book pocket bin.

(2) Costs.

Labor		
2 men labeling at $10,000 per man		$20,000 per year
4 men collating $10,000 per man		40,000 per year
Materials		
Same as manual system		$36,400 per year
Equipment		
2 labeling machines at $12,500 per machine =	$25,000	
4 collating tables at $300 per table =	1,200	
	$26,200	
Allocate over 5 years		$5,240 per year
Total yearly cost		$101,640

d. Separate continuous computer forms. Separate forms for pockets, book cards and spine labels.

(1) Procedure.

(a) Pocket, book card and spine label will be printed in control number sequence in separate runs on the computer printer.

(b) Collators will perform the same functions as in automatic label application.

(2) Costs.

Labor		
4 collators at $10,000		$40,000 per year
Materials		
1 label at $1.20 per thousand =	$1.20	
1 book pocket and book card at $25,00 per thousand =	25.00	
	$26.20	
At 2,800 thousand books per year		$73,360 per year
Equipment		
4 collating tables at $300 = $1,200		
Allocate over 5 years		240 per year
Total		$113,600 per year

e. Combined continuous computer form. Book card attached to book pocket with perforations. Spine label attached to backing adjacent to book card.

(1) Procedure.

(a) Pocket, book card and spine label will be printed on a combined form on the computer.

(b) Collation will be performed on the processing line.

(2) Costs.

Labor		
8 additional pocket pasters/collators at $10,000		$ 80,000 per year
Materials		
Combined form	$30,00 per thousand	
At 2,800 thousand books per year		84,000 per year
Equipment		
Eliminate 9 spine labeling machines at $2,500 = $22,400		
Allocate over 5 years		-4,480 per year
Total		$159,520

(3) Summary of costs per year:

Method	Labor ($1,000)	Material ($1,000)	Equipment allocation ($1,000)	Total ($1,000)	Savings over manual ($1,000)
Manual label application	170.0	36.4	1.4	207.8	-
Semiautomatic label application	80.0	36.4	4.8	121.2	86.6
Automatic label application	60.0	36.4	5.2	101.6	106.2
Separate continuous computer forms	40.0	73.4	.2	113.6	94.0
Combined continuous computer forms	90.0	84.0	-4.5	159.5	48.3

(4) Recommendation.

The semiautomatic labeling system is recommended. It offers significant savings over the manual system. It avoids the sequence control problem on the automatic application system. It is a straightforward system that requires no machine development. It uses the superior folded and glued pocket.

It is also recommended that ANYLTS pursue the development of an automatic application machine and an acceptable continuous form to see if the savings potential in these systems can be realized.

Schedule E-III

Pocket Pasting and Spine Labeling

1. Definition: This function receives completed pockets from pocket preparation, and books from mobile bin storage. It unloads the mobile bins in control number sequence and places pockets and spine labels on the books.

2. Alternates:

a. Manual application of spine label.

(1) Procedure.

(a) Pick up label from dispenser with fingers.

(b) Paste label onto back spine.

(2) Costs.

(a) Labor.

3.7 men at $10,000 per year	$37,000 per year

(b) Equipment.

Nine label dispensers at $200	$1,800	
Allocate over five years		240 per year

(c) Total $37,240 per year

b. Semiautomatic spine label application.

(1) Procedure.

(a) Holding book upright, slide spine end into book guides.

(b) Press foot switch which tacks label to book.

(e) Manually press label around book.

(2) Costs.

(a) Labor.

1.7 men at $10,000 — $17,000 per year

(b) Equipment.

Nine machines at $3,000 = $27,000

Allocate over five years — 5,400 per year

(c) Total — $22,400 per year

3. Summary.

	Labor (dollars)	Equipment allocation (dollars)	Total (dollars)	Savings (dollars)
Manual	37,000	240	37,240	-
Semiautomatic	17,000	5,400	22,400	14,840

4. Recommendation. Use semiautomatic spine labeling.

Schedule E-IV

Book Covering and Gluing

A. Definition: Placing plastic cover around dust jacket and gluing covered jacket to book.

B. Alternatives.

1. Precut covers.

a. Procedure. Use Suffolk System.

b. Cost per year.

(1) Labor =	$190,000
(2) Material $0.045 per cover x 2,460,000 covers per year =	$110,700
(3) Total yearly cost =	$300,700

2. Continuous film laminated covers.

Note: Development required on this machine.

a. Procedure.

(1) Machine is set to cover width.

(2) Cover is placed face down on film Web.

(3) Plows fold excess width under cover.

(4) Electric eye cuts covers off.

(5) Gluer glues completed cover to book.

b. Cost per year.

(1) Labor (estimate) =	$160,000
(2) Material $.04 per book x 2,460,000 books per year =	$ 98,400

(3) Equipment

Eight machines at $6,750 each =	$54,000
Allocate over five years	10,800
(4) Total yearly cost	$269,200

3. Summary.

Method	Labor ($1,000)	Material ($1,000)	Equipment allocation ($1,000)	Total ($1,000)	Savings ($1,000)
Precut	190.0	110.7	-	300.7	-
Continuous	160.0	98.4	10.8	269.2	31.5

4. Recommendation. At this point the precut cover must be recommended because the continuous film method needs work before it is practical. ANYLTS should encourage suppliers to make a machine capable of filling the specifications outlined above.

Schedule E-V

Sorting

Definition: This function receives processed books from the processing lines and sorts them into the assigned library bin.

Alternatives:

1. Manual sortation using control number control.

   a. Procedure.

      (1) Book cover gluer places books on mobile bins in control number sequence.

      (2) Data Processing prepares a distribution sheet showing the number of books of each title that go to each system. The distribution sheet will be printed in a title within system sequence.

      (3) Sorter pushes the mobile bin to the first system.

      (4) Sorter searches distribution sheet for books going to the first system. When he finds an item, he pulls the required books and sorts them to the individual libraries.

   b. Costs per year.

(1) Labor	9 men at $10,000	= $90,000
(2) Equipment	18 mobile bins at $300 = $5,400	
	Allocate over five years	1,080
(3) Total		$91,080

2. Manual sortation using system sort.

   a. Procedure.

(1) Book cover gluer places books on a mobile bin in system storage lots.

(2) Sorter pushes the mobile bin to the library bins and distributes the books.

b. Costs per year.

(1) Labor	8 men at $10,000	= $80,000
(2) Equipment	18 mobile bins at $300 = $5,400	
	Allocate over five years	1,080
(3) Total		$81,000

3. Automatic sort.

a. Procedure.

(1) Book cover gluer places book on empty tray of sorting conveyor.

(2) Dispatcher reads system code from spine label and keys it into sorter memory.

(3) Sorter conveyor drops books in system chutes.

(4) Sorter picks up batches of books from system chute and distributes them to library bins.

b. Costs per year.

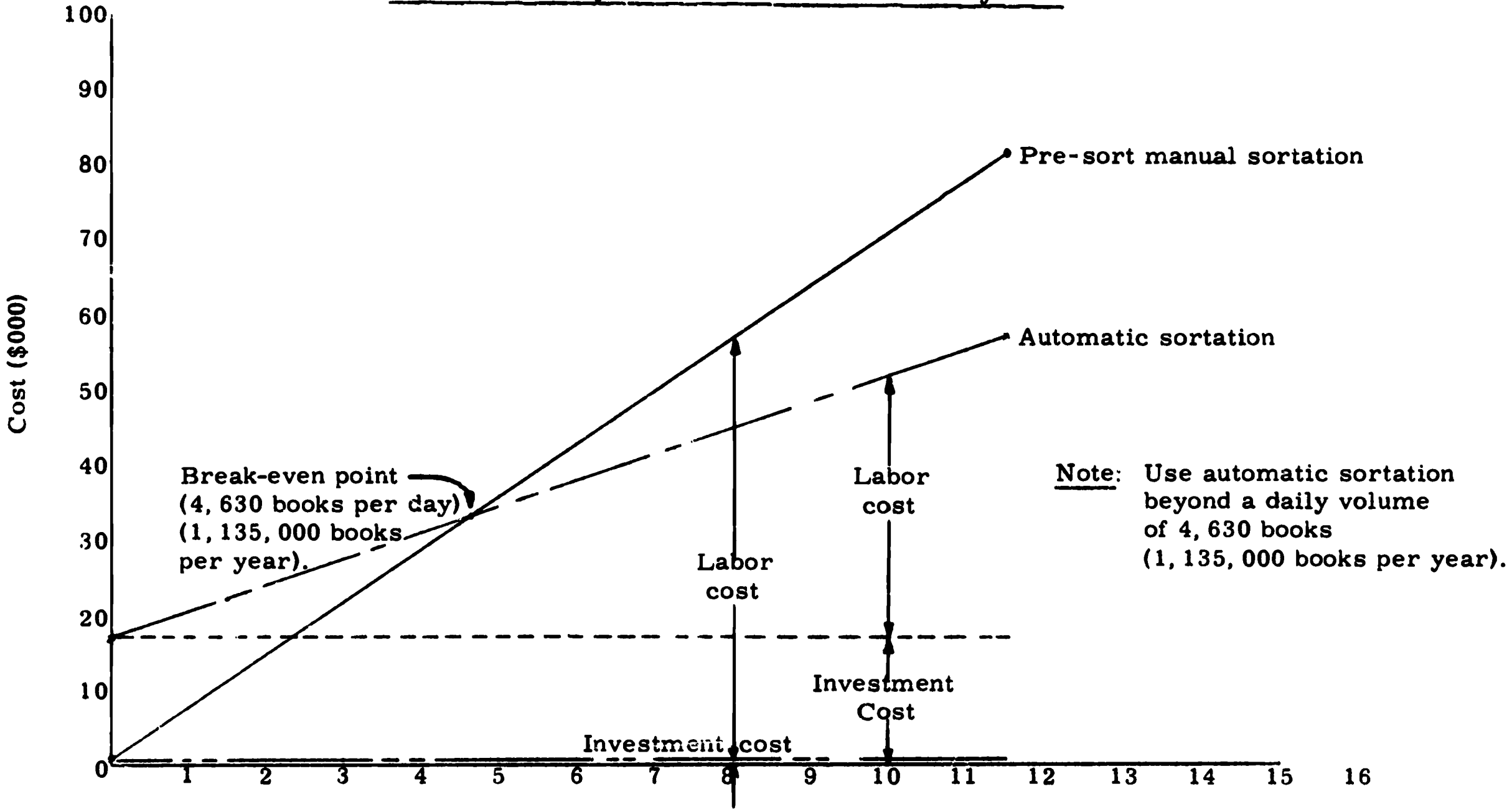
(1) Labor	4 men at $10,000	= $40,000
(2) Equipment maintenance	1/5 man at $10,000	2,000
	Sorter conveyor $85,000	
	Allocate over five years	17,000
(3) Total		$59,000

Summary:

Method	Labor ($1,000)	Equipment ($1,000)	Total ($1,000)	Savings ($1,000)
Manual using control number	90.0	1.1	91.1	
Manual using system subsort	80.0	1.1	81.1	10.0
Automatic sort	42.0	17.0	59.0	32.1

Recommendation: Use automatic sortation system.

Breakeven Analysis -- Automatic Sortation System



Schedule E-VI

Packing

1. Definition. The packing function covers removal of books from the library bins, placing the books into cases and labeling the cases. Small lots will be packed in envelopes and the envelopes will be put into system cases.

2. Alternates.

a. Use two sets of library bins.

(1) Procedure. Use sets of bins on alternate days.

(2) Costs.

Labor	
1 man at $10,000	$10,000 per year
Equipment	
Duplicate set of bins $23,600	
Allocate over 5 years	4,620 per year
Space	
3,380 square feet at $3	10,140 per year
Total	$24,760

b. Use one set of push-through bins -- no separators.

(1) Procedure. At the end of a cycle the books will be pushed from the front to the rear of the bin.

(2) Costs.

Labor	
1/5 man at $10,000	$ 2,000

c. Use of one set of push-through bins and separators.

(1) Procedure. At the end of a cycle, the books will be pushed from the front to the back of the bin and a divider inserted.

(2) Costs.

Labor
1 man at $10,000 $10,000 per year

3. Summary.

Method	Labor ($1,000)	Equipment allocation ($1,000)	Space ($1,000)	Total ($1,000)	Savings ($1,000)
Two sets of bins	10.0	4.6	10.1	24.8	
Push-through bins	2.0			2.0	22.8
Push-through bins with dividers	10.0			10.0	14.8

4. Recommendation. Use push-through bins with no dividers. We feel the separation of cycles will not be prone to be a problem because the bins will store books two deep.

EXHIBIT F

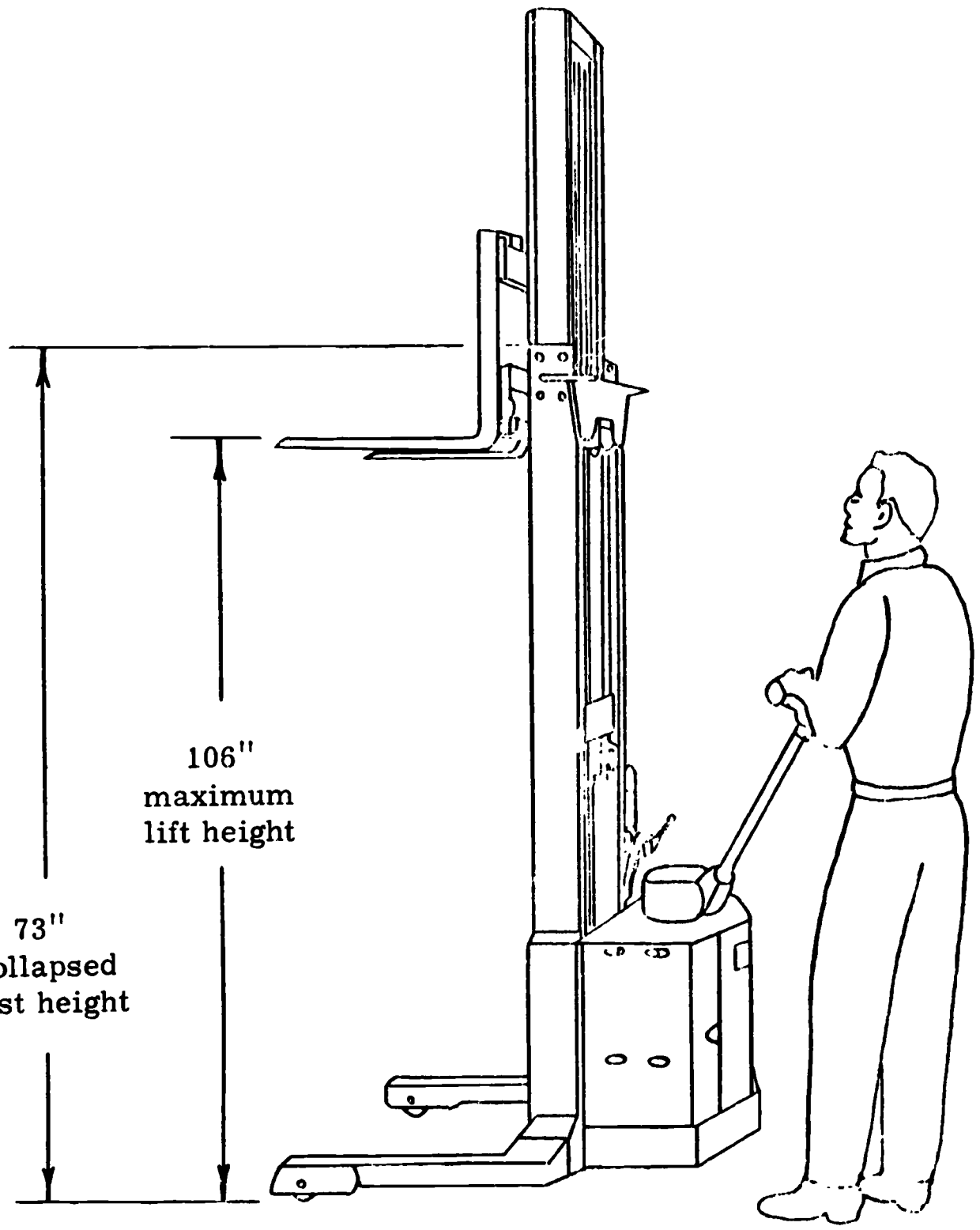
EQUIPMENT

Schedule F-I

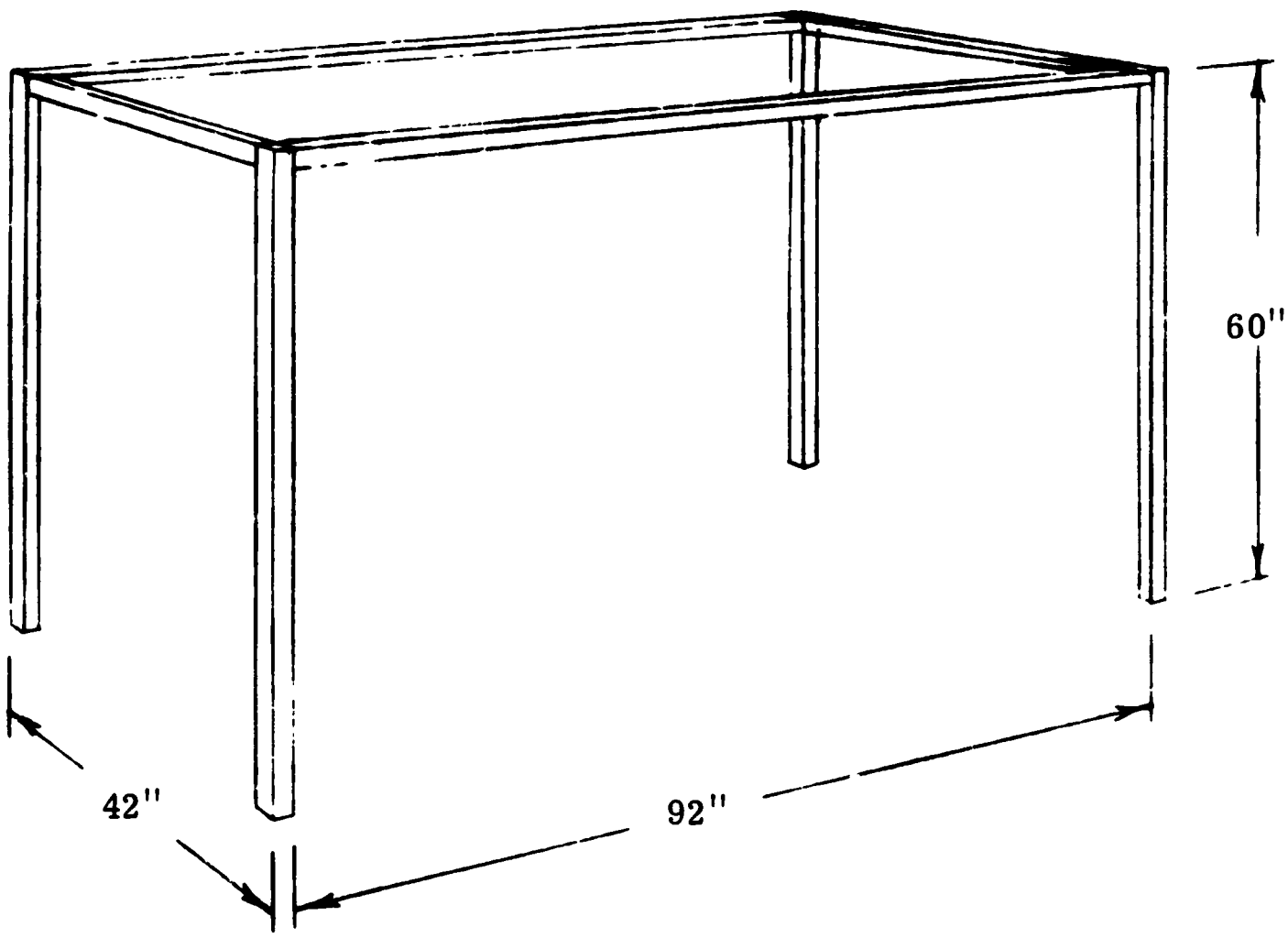
Equipment Specifications and Costs

Description	Reference exhibit number	Number of units	Cost per unit	Capital cost	Annual cost
Walkie stacker, electric, straddle-type, 2,000-pound capacity at 24-inch load center, for use with 48" x 40" pallets, lift a maximum of 106", 71-inch lowered mast height, 24-volt system, industrial-type battery capable of performing efficiently for an eight-hour period, battery charger, f.o.b. Metropolitan New York.	F-II	1	$ 3,000	$ 3,000	$ 600
Pallet rack, single entry, double-tier, two pallets per opening, 2,000 pounds per pallet, adjustable, installed, f.o.b. Metropolitan New York.	F-III	22	56	1,232	247
Wooden pallets, single wing, 48" x 40", 2,000-pound capacity, nonreversible, double-face, two-way, f.o.b. Metropolitan New York.	F-IV	120	5	600	120
Mobile bins, four-wheel type, 48 inches long x 24 inches wide x 77 inches high, 5 openings, 14-inch high openings, 8-inch polyurethane casters -- 2 fixed and 2 swivel, 200-pound capacity per shelf, f.o.b. Metropolitan New York.	F-V	100	300	30,000	6,000
Labeling machines, air-activated via foot pedal, to receive sheets of labels, strip self-stick labels from backing and apply to cards and pockets, capable of a minimum of 115 labels per minute, similar to Soabar Model 110, installed, f.o.b. Metropolitan New York.		17	2,500	42,500	8,500
Worktables, 4 feet wide x 5 feet long x 29 inches high, 600-pound capacity, used in labeling operation, f.o.b. Metropolitan New York.	D-IV	10	75	750	150
Worktables, 4 feet wide x 30 feet long (three 10-foot sections) x 31 inches high, 1,000-pound capacity, used in processing operation, f.o.b. Metropolitan New York.	D-III	27 ten-foot sections	150	4,050	810
Flow track conveyor, mounted on worktables, three 8-foot sections per table, used to transport books during processing operations on masonite boards, masonite board to be supported by two parallel tracks, maximum weight per board is 50 pounds, board measures 24 inches long x 18 inches wide, installed f.o.b. Metropolitan New York.	D-III	9	250	2,250	450

Description	Reference exhibit number	Number of units	Cost per unit	Capital cost	Annual cost
Transfer tables, ball-type, used to transfer masonite boards filled with books between conveyor sections, 24 inches long x 24 inches wide, 50-pound capacity, installed, f. o. b. Metropolitan New York.	D-III	9	250	2, 250	450
Masonite boards, 24 inches long x 18 inches wide x 1 inch thick, capacity per board is 50 pounds, f. o. b. Metropolitan New York.	D-III	100	3	300	60
Pasting machine, similar to that currently used at Nassau, continuous-feed roller, manually fed, used in pasting of pockets and glueing of book covers to books, similar to Potdevin Model LM6, f. o. b. Metropolitan New York.		18	205	3, 690	738
Automatic sortation system, similar to speaker sortation sorter capable of sorting a minimum of 75 books per minute, keying-in of destination typed manually, one book per tray, size of tray is 24 inches long x 15 inches wide, tray tilts to release book, installed, f. o. b. Metropolitan New York.	D-I	1	85, 000	85, 000	17, 000
Storage bins, 60 inches wide x 24 inches deep x 74 inches high, adjustable shelves, 6 shelves plus top per bin, 12 inch height per opening, 300-pound capacity per shelf, dividers separate each opening, width of opening is 15 inches, top of bin is used for large books and for overflow of an opening, installed, f. o. b. Metropolitan New York.	F-VI	77	300	23, 100	4, 620
Packing carts, 4-wheel type, 2 rigid and 2 swivel casters, 48 inches long x 24 inches wide, 500-pound capacity, 8-inch diameter polyurethane wheels, 2 shelves, top shelf 37 inches above floor level, push handle at end near swivel casters, f. o. b. Metropolitan New York.	F-VII	10	80	800	160
Dockboard, LTL-type, high profile, 6 feet wide x 30 inches long, service trucks 4 inches below to 6 inches above dock level, manually operated, 15, 000-pound capacity, similar to Kelley Company Model LTL, installed, f. o. b. Metropolitan New York.		3	450	1, 350	270
Subtotal				$200, 872	$40, 175
Contingency -- 10 percent				20, 128	4, 025
Total				$221, 000	$44, 200

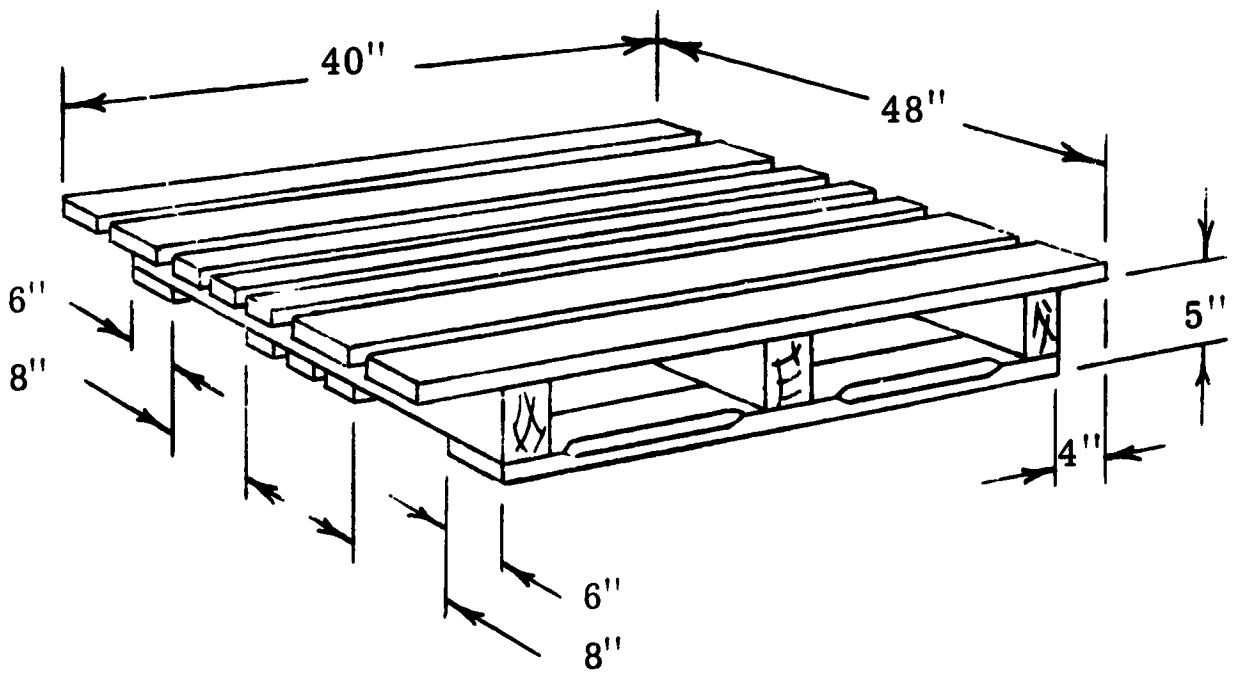


DATE	DRAKE, SHEAHAN, SWEENEY AND HUPP 330 MADISON AVE. NEW YORK 17, N.Y.	Straddle-type Walkie Fork Lift Truck	DESIG.
DRN.			DWG.
CKD.			REP. 1604
APP.	SCALE Not to scale		EXH. F-II



Weght of loaded pallet: 2,000 pounds

DATE	DRAKE, SHEAHAN, SWEENEY AND HUPP	Single Entry, Double Tier, Pallet Rack	DESIG.
DRN.	230 MADISON AVE. NEW YORK 17, N.Y.		DWG.
CKD.			REP. 1604
APP.	SCALE Not to scale		EXH. F-III

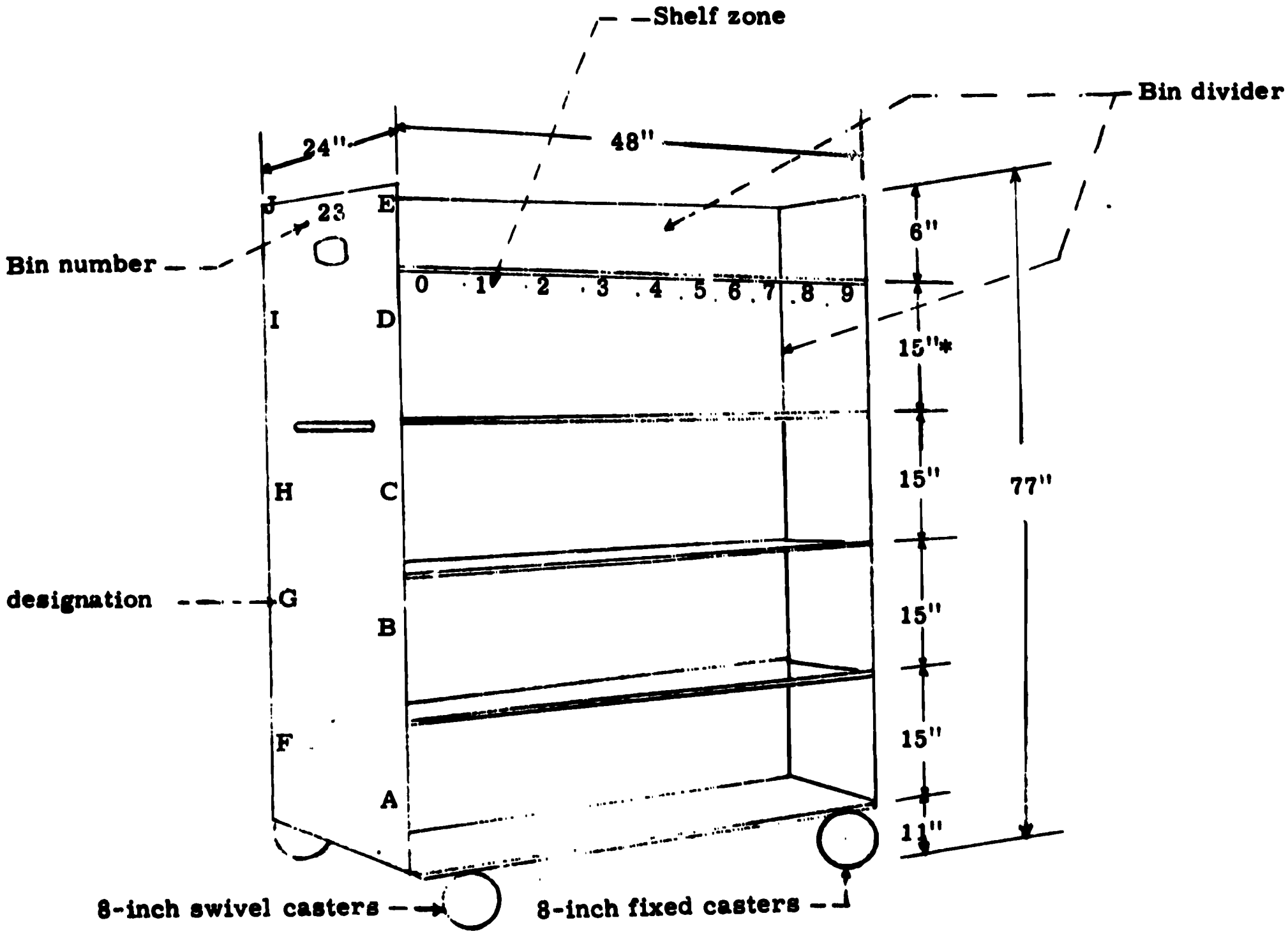


Capacity: 2,000 pounds

DATE	DRAKE, SHEAHAN, SWEENEY AND HUPP	Pallet, Wood, Single Wing, Double Face, Nonreversible, 2-Way	DESIG.
DRN.	330 MADISON AVE. NEW YORK 17, N.Y.		DWG.
CKD.			REP. 1604
APP.	SCALE Not to scale		EXH. F-IV

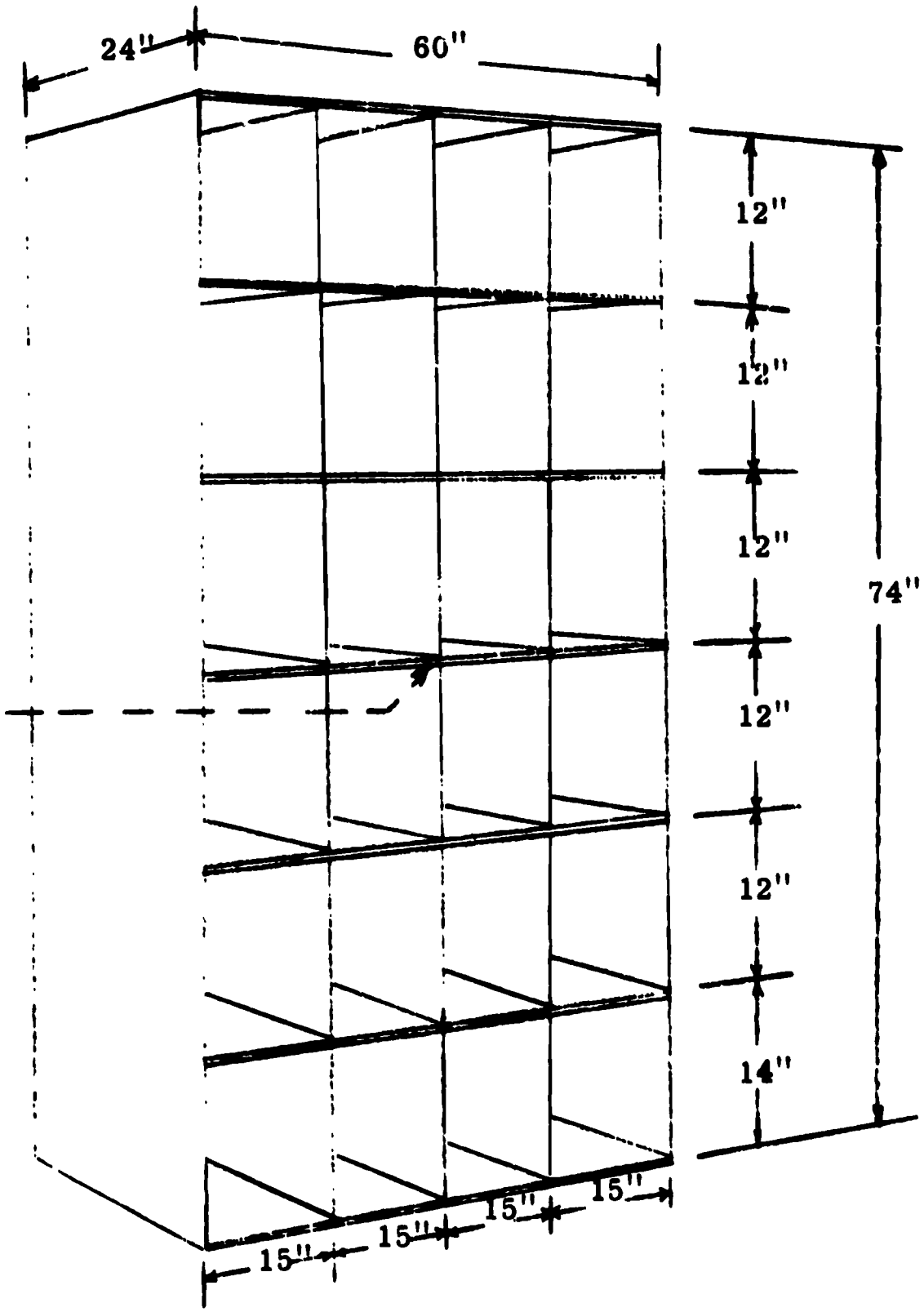
Schedule F-V

Mobile Bin



* Shelf thickness equals 1 inch.

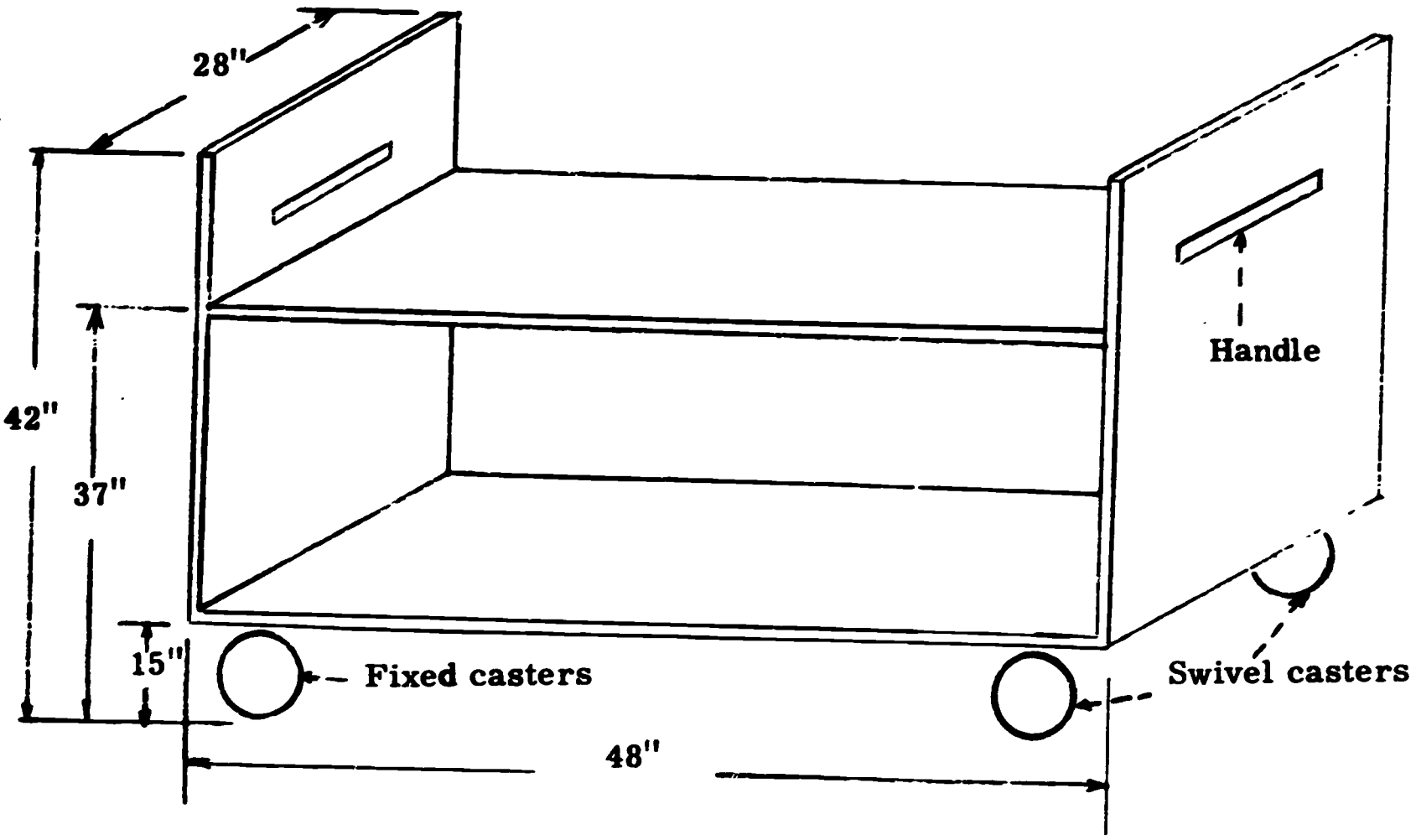
Schedule F-VI
Push-through Library Sorting Bins



Capacity: 300 pounds per shelf.

Schedule F-VII

Packing Cart



Capacity: 500 pounds.
Four 8-inch diameter casters; two swivel, two fixed.
Casters to be polyurethane.

EXHIBIT G

PROCEDURES AND JOB DESCRIPTIONS

Schedule G-I

Procedures

B. Receiving procedure

Function	Steps in procedure
Dockman	1. Deliver an empty pallet to tailgate of truck.
Driver	2. Stack cartons on pallets.
Dockman	3. Check package count against bill.
	4. Place pallets in storage.
	5. Inform Distribution Supervisor of arrival.
	6. Transfer lots to check-in as requested.

C. Check-in procedure

Function	Steps in procedure
Distribution Supervisor	1. Receive arrival notice from dock.
	2. Determine if invcice or packing slip available. If not, initiate search.
	3. If available, enter lot on log.
	4. As required, request lots from receiving in the order of the log.
	5. Check lot off log.
	6. Assign a checker to the lot. Give him invoice or packing slip.
Checker	7. Obtain an empty mobile bin.
	8. Scan invoice or packing slip to determine characteristics; note especially all cases of a large number of books for a title.
	9. Open cartons and shelve books by title. When a title is found that contains a large number of books, estimate the space required in the mobile bin and leave it open. 10 percent of each shelf should be left open to accommodate any necessary reshelving.
	10. After the lot is shelved, start at the first storage location and record the storage location for each title on the invoice or packing slip. When a title is found that already has a location listed, the title should be combined in that location.
	11. After all titles have been given a location, check the number of books on the invoice with the number on the bin in the indicated location. Correct the number on the invoice, if necessary, and cross off titles not received.

C. Check-in procedure
(continued)

Function	Steps in procedure
Checker	12. Record bin number and shelf location number on invoice for each title.
	13. Push full bins to mobile bin storage.
	14. Send completed invoices to computer input.

D. Pocket preparations

Function	Steps in procedure
Distribution Manager	1. Receive from EDP in storage location order:
	a. Catalog cards in glassine envelopes.
	b. A roll of book pocket and book card labels for each mobile bin lot.
	c. A roll of open labels for each mobile bin lot.
	d. Process control cards for each mobile bin lot.
	2. Distribute materials to tables.
Labeler	3. Feed reel of labels into machine.
	4. Insert book pocket into labeling machine and apply book label.
	5. Reposition book pocket and apply library label.
	6. Remove book pocket from labeling machine and insert book card.
	7. Apply book label.
	8. Check book card for second card sentinel.
	9. If second card sentinel is present, insert second book card in labeling machine and apply label.
	10. Place book card(s) into book pocket.
	11. Pick up glassine envelope containing catalog cards, check to insure match and place envlope into book pocket.

D. Pocket preparations
(continued)

Function	Steps in procedure
Labeler	12. Place completed pocket in tray being careful to keep pockets in order.
	13. When a mobile bin lot is complete, attach the roll of spine labels and process control codes to the book pocket tray.
	14. Deliver completed trays to processing.

E. Processing procedure

Function	Steps in procedure
Distribution Supervisor	1. Receive book pocket bins from computer output.
	2. Bring mobile bin indicated to processing area.
	3. Place book pocket bin on mobile bin.
Book Pocket Gluer	4. Transfer books to masonite boards on process line in control number sequence.
	5. Place "No Cards" books on storage shelf.
	6. Glue pocket to book according to instructions.
	7. Attach spine label.
	8. Push books to next station.
Book Coverer	9. Note book size code on process control card or if no code, measure book and write code on card.
	10. Take required number of covers from stock.
	11. Insert dust covers into plastic covers.
	12. Loosely wrap cover around book and push to next station.
Book Cover Gluer	13. Glue cover according to instructions.
	14. Remove process control card from bo
	15. Place books on sorting conveyor with library label up.

F. Sorting procedure

Function	Steps in procedure
Sorter Operator	1. Read system code from spine label and key the system code into the sorter memory.
Sorting Conveyor	2. Drop books in library system chutes.
Sorter	3. Pick up batches of books from a system chute and distribute the books to the library bins.
	4. Repeat steps 1 and 2 until all books are distributed.
	5. Return empty mobile bin to storage.
	6. At the end of a cycle, push the books for each library to the back of the bin.

G. Packing procedure

Function	Steps in procedure
Packer	1. Receive packing slip from EDP.
	2. Count books in each library bin and compare with packing slip. Note all discrepancies.
	3. Obtain packing material.
	4. Place small shipments in envelopes. Place envelopes within a system in a shipping case.
	5. Place large shipments in cartons.
	6. Attach a shipping label to all envelopes and cases.
	7. Collect shipping cases for a system on a pallet.
Dockman	8. Using the walkie-lift, deliver completed pallets to shipping.

H. Shipping procedure

Function	Steps in procedure
Dockman	1. Store pallets in rack.
	2. Deliver pallet to truck as trucks arrive.
Driver	3. Load cases from pallet into truck.
Dockman	4. Complete shipping documents.

Schedule G-II

Job Description

A. **Distribution Supervisor** — 1 required

Areas of responsibilities — **Number of men**

1.	Receiving and shipping	2
2.	Check-in	7
3.	Sorting	5
4.	Packing	5
	Total	19

Duties

1. Supervise employees
2. Maintain log of arrivals
3. Schedule work through check-in
4. Maintain packing materials supply

B. **Processing Supervisor** — 1 required

Areas of responsibilities — **Number of men**

1.	Pocket preparation	8
2.	Processing	28
	Total	36

Duties

1. Supervise employees
2. Give assignments
3. Balance lines

C. Dockmen — 2 required

Activity	Percent of time
1. Receive and store incoming books	51
2. Transport pallets to check-in	27 1/2
3. Transport empty cartons and pallets to packing	4 1/2
4. Transport full pallets to storage	4 1/2
5. Deliver books to dock for shipping	4 1/2
6. Complete shipping paperwork	8

D. Checker — 7 required

Activity	Percent of time
1. Unpack and shelve books	44
2. Check books and record on invoice	54
3. Push mobile bin to storage and obtain empty bin	2

E. Labeler — 8 required

Activity	Percent of time
1. Obtain materials and set up station	8
2. Label book pocket and book card and collate catalog card	84
3. Attach spine labels and process control cards to book pocket bin	8

F. Book pocket gluer — 6 required

Activity	Percent of time
1. Transfer books to processing line	15
2. Glue in pocket	38
3. Attach spine label	40
4. Miscellaneous	7
a. Separate "No Card" books	
b. Place card in no process books	

G. Book coverer — 13 required

Activity	Percent of time
1. Obtain covers from stock	5
2. Place dust cover in plastic wrap	51
3. Replace cover on book	32
4. Miscellaneous	12

H. Book cover gluer — 6 required

Activity	Percent of time
1. Glue cover	71
2. Remove process control card	7
3. Place book on conveyor	11
4. Miscellaneous handling of books	11

I. Sorter operator — 1 required

Activity	Percent of time
Key in library system	100

J. Sorter — 4 required

Activity	Percent of time
1. Pick up books from system chute	24
2. Walk to and from system bins	13
3. Sort into library bins	56
4. Push books to back of bins at the end of a cycle	7

K. Packer — 5 required

Activity	Percent of time
1. Count books in bin	54
2. Obtain packing material	4
3. Pack cartons	39
4. Seal and label	1
5. Place on system pallet	2

EXHIBIT H

MANNING

Schedule H-I

Manning Requirements and Costs -- Recommended System

	Operation	Standard minutes	Number of men[a]	Manning cost[b]
1.	Receiving	400.9	1	$ 10,000
2.	Unpacking, checking and storing	2,695.2	7	70,000
3.	Labeling	3,490.6	8	80,000
4.	Transport mobile bins to processing	75.3	6	60,000
5.	Pasting, spine labeling	2,106.3		
6.	Covering	5,453.6	13	130,000
7.	Gluing	2,560.0	6	60,000
8.	Sorting	1,809.0	5	50,000
9.	Packing	2,120.1	5	50,000
10.	Shipping	109.4	1	10,000
	Subtotal -- touch labor	20,810.4	52	$530,000
11.	Supervision	20,820.4	2	28,000
12.	Vacation coverage (10 percent of touch labor)		5	50,000
13.	Absenteeism coverage (7 percent of touch labor)		4	40,000
14.	Trainees (5 percent of touch labor)		3	30,000
	Subtotal -- miscellaneous labor		14	$148,000
	Total manning		66	$668,000

---

[a] Based on seven-hour workday.

[b] The design year wage rate is $10,000 per year. It assumes:

(1) Design year of 1976.
(2) 1970 base rate of $4,800 plus 30 percent fringe benefits.
(3) An 8 percent compounding increase in the cost of labor. Our recent experience shows this to be the trend.

Schedule H-II

Manning Requirements and Costs -- Basic Manual System

	Operation	Standard minutes	Number of men[a]	Manning cost[b]
1.	Receiving	400.9	1	$ 10,000
2.	Unpacking, checking, and storing	2,695.2	7	70,000
3.	Labeling	7,168.3	17	170,000
4.	Transport mobile bins to processing	75.3	6	60,000
5.	Pasting, spine labeling	2,106.3		
6.	Covering	5,453.6	13	130,000
7.	Gluing	2,560.0	6	60,000
8.	Sorting	3,281.0	8	80,000
9.	Packing	2,120.1	5	50,000
10.	Shipping	109.4	1	10,000
	Subtotal -- touch labor	26,223.4	64	$640,000
11.	Supervision	25,970.1	2	28,000
12.	Vacation coverage (10 percent of touch labor)		7	70,000
13.	Absenteeism coverage (7 percent of touch labor)		5	50,000
14.	Trainees (5 percent of touch labor)		3	30,000
	Subtotal -- miscellaneous labor		17	$178,000
	Total manning		81	$818,000

[a]Based on seven-hour workday.

[b]The design year wage rate is $10,000 per year. It assumes:

(1) Design year of 1976.
(2) 1970 base rate of $4,800 plus 30 percent fringe benefits.
(3) An 8 percent compounding increase in the cost of labor. Our recent experience shows this to be the trend.

Schedule H-III

Seasonal Factor in Labor Requirements[a]

	Operation	Manning at[b] Low volume	Average volume	High volume
1.	Receiving	1	1	1
2.	Unpack, sort and check	5	7	9
3.	Labeling	7	8	10
4.	Transport mobile bins to processing	5	6	8
5.	Pasting and spine labeling			
6.	Covering	10	13	17
7.	Gluing	5	6	8
8.	Sorting	3	5	6
9.	Packing	4	5	7
10.	Shipping	1	1	1
	Subtotal -- touch labor	41	52	67
11.	Supervision	2	2	2
12.	Vacation coverage	14	5	-
13.	Absenteeism coverage	4	4	4
14.	Trainees	5	3	-
	Subtotal -- miscellaneous	25	14	6
	Total manning	66	66	73

---

[a]A seasonal factor of 32 percent is anticipated.

[b]Low-volume = 8, 000 books per day; average volume = 11, 500 books per day; high volume = 15, 000 books per day.